

MY FIRST EXPERIENCE WITH A BERLESE FUNNEL

Anthony Thomas is a regular contributor to Micscape, and I thank him for it. His articles are always illustrated with amazing pictures. I will not pretend to have his talent or expertise, but he does inspire me to push a little harder and explore a little further.

A few months ago he wrote a series of articles about the use of a Berlese funnel to collect small critters that hide in leaf litter. As my regular followers may know, I have an insatiable curiosity, so after reading these articles (and seeing those photographs!), I had to go and look for myself.

First, I had to wait for the snow to melt... Then I had to make myself a Berlese funnel. My needs being modest, I made one with a big plastic bottle. I simply cut the bottom, which can be used as a cap; just cut a series of vertical slices about 1 cm long so that it can slip back on the bottle. A metallic mesh at the bottom prevents detritus from falling down but allows the critters to pass through. A small whole drilled in the side of the bottle make it possible to mount it on a stand; with the bottle cap removed a small container (a 35mm film container) filled with alcohol receives whatever manage to wriggle its way down. I did not even bother with a light above the whole set-up. It just goes to show that you don't necessarily need expensive professional equipment to explore the world around you. With a bit of work and resourcefulness one can come up with home-made solutions to many problems.

After a few days, the content of the canister was poured in a petri dish and examined under a low power binocular. One or two handful of dry leaves gave me dozens of small critters. For a while, every time that I thought that I had found everything a new specimen was found. As was the case with Anthony, a large proportion of the critters were made up of various mites. I also found two very small spiders, a few larvae (midges and coleoptera?), and a pupa (micro-Lepidoptera?). The largest organism caught was a rove beetle. Another one was a surprise: a pseudoscorpion, a tiny arachnid with a pair of pincers but no curved tail. I had not seen one of those in years.

After a quick look at what was collected I made a few permanent mounts for future reference. These were used to make the photographs that we see here. A bit of work with a dash of curiosity allowed me to see for myself the amazing quantity and diversity of small organisms that inhabit leaf litter. I will certainly try the same experiment again in different seasons and from different locations.





As mentioned, mites formed a big percentage of what was found. They are so small that they ended up in various positions in my permanent mounts. The chosen mounting media was made of 30 ml Elmer's clear glue, 15 ml Lactic acid, and 1.5 ml glycerin. The acid in this media can help clear the tegument of arthropods, making them more transparent.



Three larvae (of midges?) were found, the first picture shows the one that came out best in my permanent mounts.

At first, I thought that the second picture could have been a protura, but now I am pretty confident that it's a beetle larva.

The last one looks like the pupa a small Lepidoptera.





Two small spiders and a rove beetle. The beetle was too big to be photographed with a standard microscope; I used one of my modified “stacking microscopes” with a Laowa 25mm Super Macro lens set at 3x magnification. The beetle was placed in a well slide filled with alcohol; a cover slide was placed on top to prevent the alcohol from evaporating too quickly and to eliminate all risk of distortions in the image. The slide was placed on a white Plexiglas background to take the picture.





The unexpected surprise of the collection: a pseudoscorpion. These tiny arachnids have pincers but they lack the tail and stinger of true scorpions. Pseudoscorpions and scorpions belong to the same subphylum, Chelicerata. However, each belongs to its own order: Scorpiones and Pseudoscorpiones. Pseudoscorpions are known to hitch a ride on the back of flying insects such as flies, probably as a way to disperse over much wider territories. The 100x magnification reveals the very interesting jaws.



Not unexpectedly, there were also a few springtails, all of them of the elongated type. The furculum can be seen in the specimen seen sideways.



All those pictures were shot by stacking several shots in order to get enough depth of field.

If you haven't already done so, take a look at the series of articles by Anthony Thomas:

<http://www.microscopy-uk.org.uk/mag/artdec20/at-garden.pdf>

<http://www.microscopy-uk.org.uk/mag/artjan21/at-garden-2.pdf>

<http://www.microscopy-uk.org.uk/mag/artfeb21/at-garden-4.pdf>

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